



TransSynergic 4000 / 5000 / 7200 / 9000
TransPuls Synergic 4000 / 5000 / 7200 / 9000

MIG/MAG, TIG DC & rod electrode (MMA) welding



PERFECT WELDING

Now some wholly new standards apply

GENERAL REMARKS

The digital system

That's the way it goes: Revolutions are either a failure, soon forgotten, or they succeed and take their place in history. Successful revolutions turn the status quo upside down. Which is what the digital welding systems from Fronius have done. In the entire industry, they were a genuine sensation. And still are. Except that today, they have moved on from being youthful upstarts to being established players on the welding scene – indeed, the digital welding systems have laid down wholly new standards: In terms of perfection, reproducibility of welding results, operator convenience and the variety of available peripherals.

The digital welding systems come with the right peripherals for every application, each optimally harmonised with all the others. From MMA all the way through to fully automated welding, the entire spectrum is covered, taking in anything from torches, hosepacks and cooling units to welding-data documentation and even communications interfaces and the facility for using high-performance processes.

The thoroughly digitised, microprocessor-controlled and digitally regulated power sources are available from 400 A to 900 A. With or without pulsed arc.



The "Human" hosepack boom prolongs the service life of the hosepack and makes for much easier handling.



UTILISATION

Rising to any challenge

The TS and TPS machines are out-and-out professionals. With a correspondingly extensive field of application. In both the craft/workshop and industrial sectors, they meet the most exacting demands. Thanks to their modular design concept, they are ideal for use in the automobile manufacturing and component supplier industries, in the fields of apparatus construction and chemical plant engineering, in the construction of machinery and rolling stock, and in shipyards. In terms of materials, each of the machines is basically suitable for welding any metal. Nevertheless, the TS machines tend to be used more for steel, while the pulsed-arc facility on the TPS machines also makes them especially suitable for aluminium, chrome-nickel, galvanised sheets and for brazing.

From the avant-garde to the mainstream

Fronius' digital machines are among its most sought-after products. One reason why these "trailblazers" have developed so fast and so well is certainly their multiprocess capability. MIG/MAG, robot welding, TIG welding with touchdown ignition, MMA – thanks to their integrated expert knowledge, they master every process with 100 % perfection.



The TPS 9000 puts out up to 900 A of power and is designed with automated and robot welding applications in mind.



Welding two different materials is easy - using twin wirefeeders.

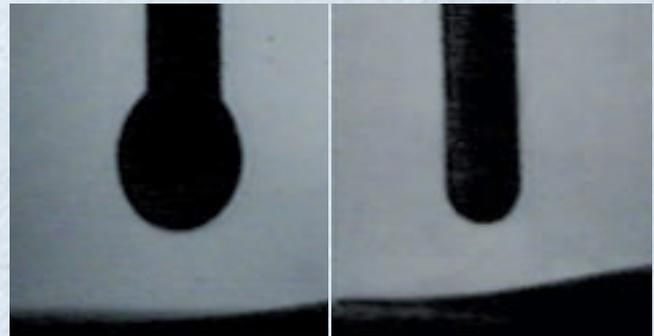
Perfection is the measure of all things

WELDING PROPERTIES

Ideally programmed ignition sequence

What prompted the development of the digital machines was a desire to achieve absolute perfection in the welding process, and 100 % reproducibility of any welding result once this has been optimised. This may be seen first and foremost in the ignition. Both the TS and the TPS machines feature an ignition sequence that has been optimised and programmed right down to the very last detail, and that is available over and over again, in the same high quality.

Depending on the application in question, there are various different ignition variants. One of these is conventional welding start-up. Here, the ignition parameters are precisely matched to the diameter and quality of the wire. Quiet, jerk-free ignition is the result. At the end of welding, a controlled current pulse sheds the last molten droplet, preventing a solid globule from forming at the tip of the electrode. And in conjunction with the Robacta Drive torch, SFI ignition makes spatter-free welding start-ups a reality.



*Conventional power source:
End of welding without burn-back impulse.*

*Digital power source:
End of welding with burn-back impulse.*

Spatter free ignition:

Wirefeed forwards

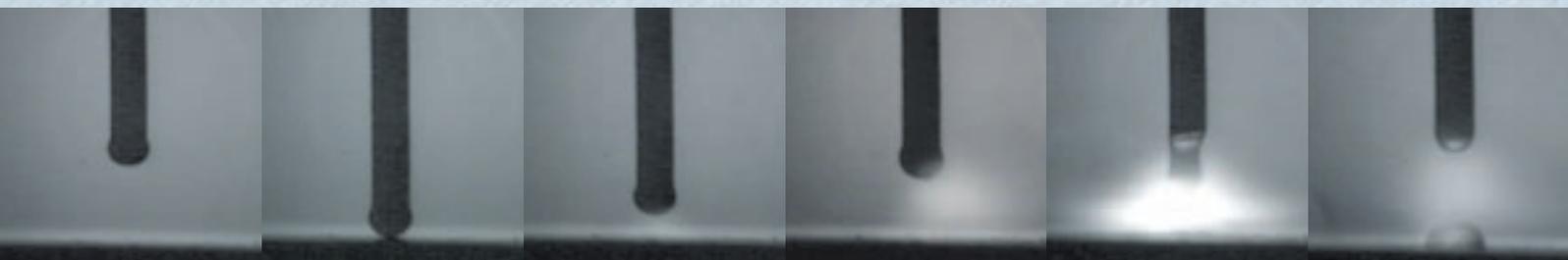
*Wirefeed stop:
short-circuit recognition*

*Wirefeed backwards:
pilot arc is ignited*

*Wirefeed backwards:
arc-length is set*

*Wirefeed forwards:
ignition is complete –
pulsed arc starts up*

Metal transfer





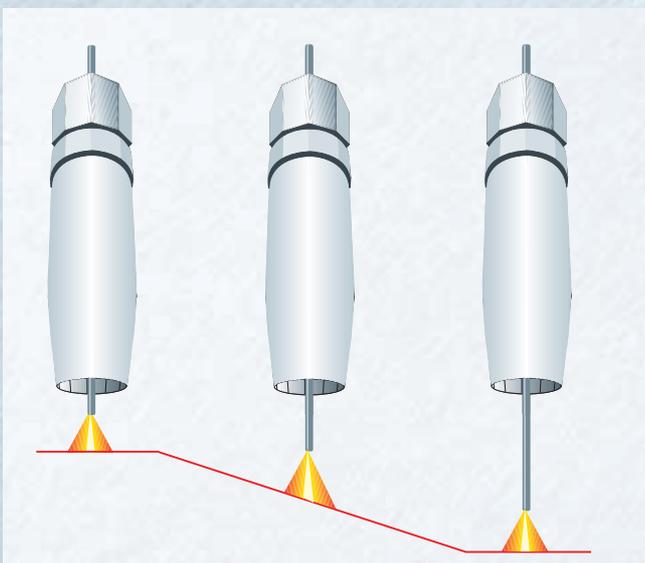
Multifunctional, in terms of both arc and process

With digital machines, all sorts of things become possible. They adapt to any and every task. Particularly in the case of the arc, very different requirements may be made, depending on the application. The digital inverter power sources permit tailor-made solutions here. When it comes to pulsed arcs, for example, there is a special pulse-form to go with every material. The machines function so precisely that only one single droplet of filler metal is detached for each current pulse. This results in virtually spatter-free welding, and means that for the first time, precision working is possible at the lower end of the power range: a 0.6 mm aluminium sheet can be welded under a pulsed arc using a 1.2 mm wire electrode with no difficulty at all.

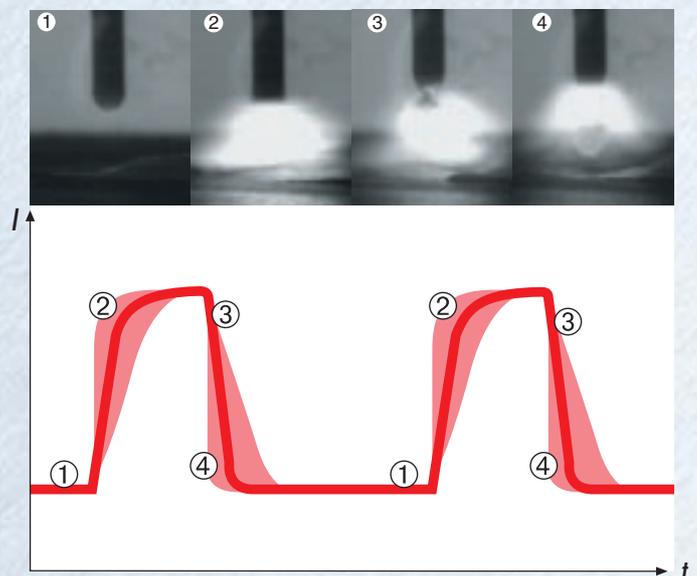
The digital arc-length control opens up wholly new perspectives as well. It works with such speed and precision that the arc length remains constant at all times; even when the stick-out changes, there is hardly any spatter.

In addition, the SyncroPuls function was developed for the TPS machines. This function superimposes a low-frequency pulse over the normal pulse, resulting in seam quality that is comparable with that of a TIG weld, and ensuring immaculate weld-seam appearance.

All digital power sources are multiprocess-capable, meaning that they are just as suitable for MIG/MAG welding as they are for TIG and MMA. The machines come with a particularly interesting TIG-welding function: TIG Comfort Stop. This cures the arc of its annoying habit of breaking at the end of welding. A defined movement of the welding torch causes the welding current to drop automatically, uninterrupted gas shielding is ensured, and the end crater is filled to perfection.



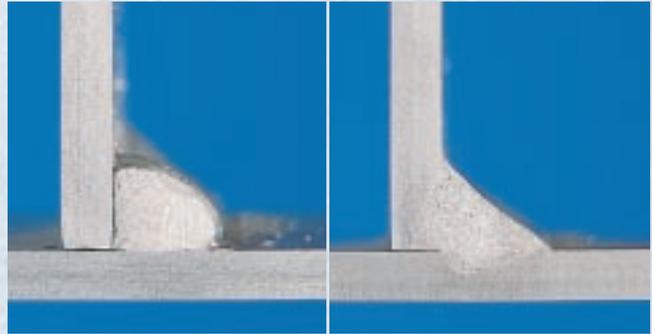
Constant arc length despite varying stick-out - thanks to digital weld process control.



Metal transfer with a pulsed arc: One droplet per pulse.

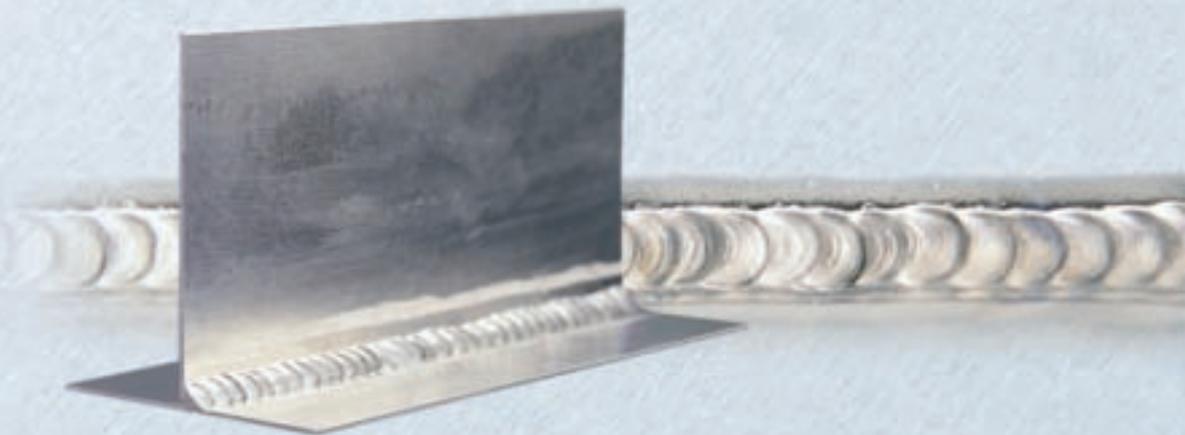
Start-up program for aluminium

There is an extra ignition variant for aluminium: In order to prevent fusion defects, the base metal has to start being melted right away, in the start-up phase. For this reason, ignition is effected at considerably higher power. After this, the welding power is lowered again. However, in order to avoid any risk of drop-through, it is also possible to immediately lower the welding power down to the crater-fill current.



*Without start-up program -
fusion defects at beginning
of seam*

*With start-up program -
no fusion defects*



*Base metal: AlMg 3
Sheet thickness: 0.6 mm
Filler metal: AlMg 5, diam. 1.2 mm
Shielding gas: Argon*

Easy working

HANDLING

Plug & Weld:

Make your choice, and off you go

Right from the product-development phase, the overriding principle at Fronius is to make the machines as easy as possible to handle. The result is power sources which are pleasant for everyone to work with. Even the complex digital machines, then, are operated using the practical "synergic-mode": One dial is all you need, to control everything. Select the material and the sheet thickness – that's all. Then off you go! The digital power sources now automatically access their integrated expert knowledge and control the entire welding process. For instance, when you specify the sheet thickness, the correct matching parameters are all called up immediately.

The control panel makes it easy for everyone

The control panel is clearly and systematically laid out, so that everybody will "see what's what" straight away. This makes for straightforward, convenient working, because everything is so easy to adjust, as well as being practically self-explanatory. By the way, you'll find an extremely practical function called Job Mode on the control panel. This series function lets you save optimised machine settings so that you can then re-use them whenever you need them. Even directly from the torch. For improved visibility, the control panel is positioned at a slant, and in such a way as to protect it from mechanical impact.



ECONOMY

A system with efficiency built in

Investing in a digital power source is worthwhile in every way. Thanks to their multi-process capability, you can weld using any welding process, be it MIG/MAG, TIG or MMA, all with one and the same machine, and always with superlative quality. Also, you save gas every time you weld. Firstly, because of the loss-free gas supply to the torch, and secondly, due to the intelligent gas-flow control. On top of this, there are the savings from the great reductions in welding spatter, the automatic cooling-unit cut-out, low open-circuit power, high efficiency, modular (and thus highly flexible) system principle, ease of access for servicing, updates via laptop As we said, a system with efficiency built into it.



JobMaster welding torch with integral remote control and weld-data display.

The success package

SYSTEM

Perfect interplay

If you want to exploit all these possibilities, outstanding welding properties and useful functions to the very full, then you must start thinking in terms of systems. In conjunction with all the peripherals, the digital power sources are perfectly co-ordinated, highly innovative and intelligent welding systems. Depending on your requirements, we can put together a custom welding system for you that is precisely tailored to your individual needs.

Smooth wirefeed

With the wirefeed, the most important thing is that the wire is fed reliably, precisely and as smoothly as possible. All the way from the wire drive to the contact tip. Firstly, so that the wire does not get damaged, and secondly, so that the welding operation runs perfectly. Fronius offer various different wirefeeder units, each of them just right for the application in question. For example for shipyards, for robot welding, for aluminium applications etc. All of them with high-grade wire drives: 2-roller or 4-roller drive, or the planetary "PT-Drive". The latter was developed specially for soft aluminium wires; its larger contact area transports the wire even more exactly. As the motor speed on every wirefeeder is digitally controlled, the wirefeed speed, too, can be set accurately and reproducibly.



4-roller drive for precision, abrasion-free wirefeed.



"PT-Drive" push-pull welding torch. The drive force is applied across a large area, ensuring superb wirefeed - even with very soft aluminium wires.



Robot welding torches for reliable current transfer

The Robacta robot welding torch comes with a brilliantly ingenious feature: Forced contacting. This ensures a defined, reliable current transfer, as the welding wire is guided through the contact tip at an exactly defined angle. Random, punctual current transfers are now a thing of the past. The result: consistently high welding quality.

In the front line with Robacta Drive

Robacta Drive is a torch with an integral wire drive for robot welding. It is mounted directly on the front axis of the welding robot. In this way, the master drive is where the action is, ensuring absolutely uniform wire travel and thus the very highest precision in the welding process. Even with long hosepacks.

And another very special innovation is the external wire guidance system. The inner liner can be changed very quickly, with no tools needed, and this keeps downtimes to a minimum.

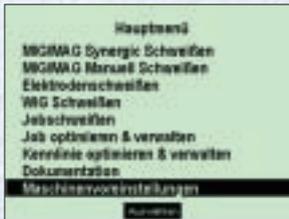


Forced contacting for exactly defined current transfer. The welding process achieves greater precision, and there is less wear-and-tear.



Robacta Drive with external wire guidance system: Inner liner can be changed very quickly, downtime is minimised.

Everything is thinkable, everything is doable



Main menu



Special 2-step

Kühlkreislauf	Ein
Zündverzögerung	10 min
Lipo-Akt/Überwachung	3,5 sec
Stöckontrolle	Ein
Sonderzeitige Jobeaster	Aus
Powersaving-Kontrolle	Ein
Drehendeabschaltung	Solort
Schweißkreiswiderstand	22 mOhm
Schweißinduktivität	10 uH

Presettings

Maximised intelligence: RCU 5000i

The RCU 5000i is an extremely easy-to-use, comfort-feature-laden remote-control unit with a full-text display. A real innovation. You can place it right next to the weldment, so that you can create and manage all jobs and characteristics “on the spot”, as well as monitoring all the welding data. It really couldn’t be easier. The RCU 5000i gives you concrete assistance every step of the way – as you need it. The other thing is that the guidance menu is structured in the same way as PC software, with a main menu, sub-menus etc. All very clearly laid out and user-friendly.

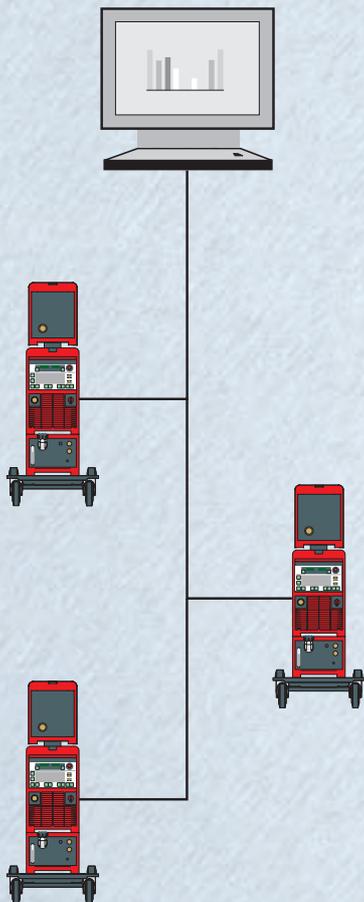
The user-guidance menu is orientated to the needs of different user groups. Each user is given his own non-contacting transponder key with which he can activate the functions that have been enabled for him. Also included: the SmartMedia card, a storage medium to which all the data can be saved for back-up, and from which it can be uploaded to the next power source or computer. The RCU 5000i also comes with an integrated quality assurance system and a Windows-compatible USB interface for updates.



RCU 5000i

Weld-data management: Welcome to WeldOffice

With Fronius WeldOffice, you can aggregate the data from all your power sources at one central point. And by “data”, we don’t just mean the welding data, but also all the telemetry data – i.e. all the data relating to the status of the machines. These data can then be visualised and archived on a computer. All the power sources can be given their own TCP/IP addresses and networked, creating the best possible basis for efficient weld-data management.

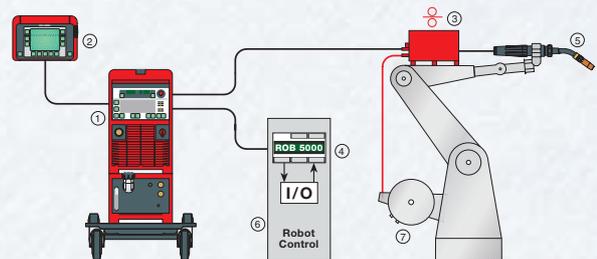


WeldOffice lets you collect, visualise, evaluate and archive the welding data from all your power sources at one central point.

System example: Robot welding

Important:

- perfect co-ordination of all system components, from the power source to the wirefeed and the welding torches, and including weld-data monitoring and documentation
- remote control with user privileges
- flexible interfacing with the robot interface



Elements for Plug & Weld:

1. TPS 4000 power source
2. RCU 5000i remote-control unit
3. VR 1500 wirefeeder
4. Rob 5000 robot interface
5. Robacta welding torch
6. Robot control
7. Wire supply

This is just one example, for robot welding. In the same way, many different variants could also be drawn up for various materials and applications. As well, of course, as countless configurations for all other requirements.

The whole is more than the sum of the parts.



VR 1500



VR 2000

PRODUCTS

Welding power sources

- TS 4000 / 5000, TPS 4000 / 5000

The world's first completely digitised, microprocessor-controlled and digitally regulated GMA inverter power sources. With matchless precision in the welding process, exact reproducibility of results and unparalleled welding properties. Among the highlights: Various different ignition variants, "made-to-measure" arcs, start-up program for aluminium, integral power source manager – all also available in a "remote" version with an external remote-control panel.

- TS 7200 / 9000, TPS 7200 / 9000

These power sources are based on a tried-and-tested solution: e.g. two TPS 5000's, linked via a high-speed data interface, together put out 900 A of power. Doing so without sacrificing any of the advantages of the digitally controlled Fronius power sources. This parallel-connected duo is designed for the high deposition rates required in automated, robot and heavy-duty welding applications.

Cooling units

- FK 4000

Water cooling unit for manual welding.

- FK 4000 R

Water cooling unit for enhanced cooling performance; e.g. with long hosepacks or in robot-welding applications.

- FK 9000 R

In high-performance applications, the FK 9000 R ensures optimum cooling. Equipped as series with a thermostat, flow-watchdog and water filter.

Wirefeed systems

- VR 1500

Small, lightweight, digitally controlled robot wirefeeder with 4-roller drive, ideal for mounting on the 3rd axis of the robot. For wirefeed speeds of 0-12, 0-22 and 0-30 m/min, as per user requirement.

- VR 1530 PD

Unreeling unit with a planetary drive, specially for automated and robot welding applications, for ensuring highly constant wirefeed even when using long hosepacks.

- VR 2000

Small, compact wirefeeder with low weight and excellent handling characteristics, incl. integral gas-flow regulator with a flow-rate indicator for a D200/K200 spool.

- VR 4000

4-roller drive with superlative wirefeeding properties, also suitable for long hosepacks. Its wirespool-holder and compact design make it very versatile indeed.

- VR 4000 Yard

Superbly adapted to the needs of shipyard operations. Handy, small and light (only 11 kg), completely enclosed and extremely reliable.

- VR 4040

40 kg unreeling device for aluminium wires. End-of-wire watchdog, heating and internal lighting. Perfect for robot applications.

- VR 7000

Portable, enclosed wirefeeder for D300/K300 spools. For wirefeed speeds of 0-12, 0-22 and 0-30 m/min, as per user requirement.



TR 4000 C

RCU 4000

Rob 5000

Robacta TC 1000

Welding torches

- AL 2300 / 3000 / 4000, AW 2500 / 4000 / 5000 / 7000

A range of water or gas-cooled torches available in just the right performance gradations to cover every power range. Forced contacting for precise current transfer, optimised swirl-free gas-flow, swivel-mounted torch handle. UpDown control for continuous adjustment of the welding power actually during welding. The JobMaster versions include an integral remote-control and display.

- **PT-Drive**

Extremely lightweight and compact push-pull torch with an innovative planetary drive system. Superb feeding of soft aluminium wires.

- **Robacta, Robacta Drive**

Robot torch with a defined current transfer, thanks to forced contacting. With Robacta Drive, the master drive is mounted directly on the front axis of the welding robot, in order to ensure abrasion-free wirefeed.

Remote-control units

- TR 2000 / 4000 / 4000 C

The right remote control unit for every requirement. TR 2000, a MIG program remote-control unit; TR 4000, a universal remote-control unit; TR 4000 C, the deluxe remote control with extra functions.

- **RCU 4000**

The RCU 4000 enables the power source to be completely remote-controlled.

- **RCU 5000i**

Innovative LCD remote-control unit. Straightforward, logical user guidance, geared to the workday needs of various different user groups; with user administration and weld-data monitoring.

Weld-data management

- **WeldOffice**

Collect all welding and telemetry data at one central point; then save, edit, visualise and archive it.

Interfaces

- **Rob 3000 / 4000 / 5000**

Standard I/O; communicate with all common makes of robots.

- **Field-bus modules**

Interface module enabling access to various bus systems, e.g. Interbus, Profibus, CanOpen, DeviceNet (fibre-optic or hard-wired technology).

Torch cleaning

- **Robacta Reamer**

A mechanical cleaning system for the gas-nozzle zone and the end face of the gas nozzle inside a robot-cell, with a special milling cutter that is designed to match the geometry of the gas nozzle and the welding torch.

- **Robacta TC 1000**

The Robacta Touchless Cleaner uses electromagnetic forces to remove the welding spatter that accumulates in the gas-nozzle zone during steel welding. This is a touchless, cost-saving method of spatter removal.

And as if all that weren't enough...

When we talk about a system, we really do mean an entire, complete system. Which is why there are many other components as well, which you can obtain at any time, to match your individual system configurations. Like the PickUp or Trabant trolleys, floor-mounted base stands, twin-head mounts, the "Human" hosepack boom, etc.

The end-product is satisfaction

SAFETY

Take it for granted

Safety – need one say more? Every Fronius machine has to pass a maximum of testing. And this is no different for the digital power sources. Far from it. Indeed, they offer even more safety. To begin with, there's the earth fault-current watchdog. In the event of a malfunction, this prevents any welding current flowing through the earth (ground) lead and destroying the PE (protective earth) system. This watchdog comes as standard. Secondly, there is the thermostat-controlled fan, which reduces dirt accumulation inside the machine because it only runs when it's actually needed. And everything else can be taken for granted: S mark, CE mark to EN 60 974/1 and EN 50 199 (including tilt test), degree of protection IP 23 for suitability for use in the field.

"Degree of protection IP 23" makes the units suitable for use in the field.



SERVICING

It's all been thought of – and it shows!

Right from the development phase, every single detail has to be thought of – and take our word for it, our developers just love getting down to the nitty-gritty! The fruits of all their meticulous work are plain to see when you look at the serviceability of our products. Particularly for power sources, this is an essential point. One of the big advantages of the digital machines here is their straightforward overall design, comprising only a small number of separate subassemblies. The system-component subassemblies are clearly and logically arranged, and easy to "get at". To make service work easier still, the machines display service codes such as "No shielding gas". For speedy error diagnosis, laptops are used. And for updates, too, incidentally: Because the core of the machines is digital, this makes it easy to keep each unit right up with the "state of the art" of welding technology.

All of these things, and more besides, have to be thought of right from the outset if the final result is to be "satisfaction". Which indeed it is!

Strain-relief device for interconnecting cables prolongs service life.



Integrated torch holder on the "PickUp" trolley.





CHECKLIST

General

4-roller drive
 Arc-break monitoring
 Automatic burn-back control
 Automatic cooling-unit cut-out
 Basket-type spool adapter
 Burn-back impulse (perfect wire-end, optimum re-ignition)
 Can be extended a module at a time
 Continuous adjustment of welding current directly from torch
 Digital weld-process control
 Earth leakage detection
 Feeder creep
 Feeder inching, without gas or current
 Energy-saving inverter technology
 Gas-test function
 Job mode
 Microprocessor control
 Overtemperature protection
 Remote-controllable

Synergic operation
 Thermostat controlled fan
 Touchdown ignition
 Welding-circuit alignment (resistance, inductivity)
Operating modes
 2-step mode
 4-step mode
 Aluminium welding start-up (special 4-step mode)
 Special 2-step mode
 Spot welding

Digital display o

“a”-dimension
 Arc-force dynamic, arc-length and droplet-detachment correction
 Globular (intermediate) arc
 “Hold” function
 Job number
 Mains voltage monitoring

Manual operation
 Motor current
 Operating mode and process
 Overtemperature
 Service codes
 Sheet thickness
 Welding amperage and voltage (actual and guideline values)
 Welding speed
 Wirefeed speed

Adjustable parameters

Arc-force dynamic
 Arc-length / droplet-detachment correction
 Burn-back time
 Continuously adjustable welding power
 Crater-fill current
 Gas pre/post-flow time
 Hot-Start

Optional

Constant-amperage / constant-voltage mode
 Crane hoisting lugs
 Current-flow signal
 End-of-wire watchdog
 Gas economiser valve
 Keylock switch
 PullMig mode
 Robot interface, analogue / digital
 Spatterfree ignition
 SyncroPuls
 TIG Comfort Stop
 Twin-head mount
 Weld Process Data (WeldOffice, JobExplorer)
 Weld-data monitoring
 Welding programs from databank

TECHNICAL DATA

	FK 4000	FK 4000 R	FK 9000 R	
Mains voltage	230 / 400 V	400 V	400 V	
Mains frequency	50 Hz	50 / 60 Hz	50 / 60 Hz	
Power consumption	0.5 A	0.5 A / 0.6 A	1.3 A	
Cooling capacity at Q = 1 l/min, +20° C	1600 W	2000 W	2730 W	
	Q = 1 l/min, +40° C	900 W	1200 W	1650 W
	Q = max, +20° C	1600 W	2300 W	4400 W
Max. delivery rate	1.6 l/min	3.5 l/min	5 l/min	
Max. pump pressure	4.5 bar	4.2 bar	5.5 bar	
Pump	Vibrating armature pump	Centrifugal pump	Centrifugal pump	
Coolant volume	5.5 l	5.5 l	9 l	
Degree of protection	IP 23	IP 23	IP 23	
Dimensions L x W x H	mm	725 x 290 x 230	725 x 290 x 230	2 x 725 x 290 x 250
	Inch	28.57 x 11.43 x 9.07	28.57 x 11.43 x 9.07	2 x 28.57 x 11.43 x 9.85
Weight (without coolant)	14.1 kg / 31.0 lb	13.3 kg / 29.3 lb	28 kg / 61.6 lb	

TECHNICAL DATA

		TS 4000 TPS 4000	TS 5000 TPS 5000	TS 7200 TPS 7200	TS 9000 TPS 9000
Mains voltage		3 x 400 V	3 x 400 V	2 x 3 x 400 V	2 x 3 x 400 V
Mains voltage tolerance		+/- 15 %	+/- 15 %	+/- 10 %	+/- 10 %
Mains fuse protection (slow-blow)		35 A	35 A	2 x 35 A	2 x 35 A
Primary continuous rating (100 % d.c.)		12.7 kVA	15.1 kVA	2 x 12.7 kVA	2 x 15.1 kVA
Cos phi		0.99	0.99	0.99	0.99
Efficiency		88 %	89 %	88 %	89 %
Welding-current range	MIG/MAG	3 - 400 A	3 - 500 A	3 - 720 A	3 - 900 A
	TIG	3 - 400 A	3 - 500 A	3 - 720 A	3 - 900 A
	Electrode (MMA)	10 - 400 A	10 - 500 A	10 - 720 A	10 - 900 A
Welding current at	10 min/25° C	75 % d.c. 400 A	75 % d.c. 500 A	-	-
		100 % d.c. 365 A	100 % d.c. 450 A	100 % d.c. 720 A	100 % d.c. 900 A
	10 min/40° C	50 % d.c. 400 A	40 % d.c. 500 A	-	-
		60 % d.c. 365 A	60 % d.c. 450 A	60 % d.c. 720 A	60 % d.c. 900 A
		100 % d.c. 320 A	100 % d.c. 360 A	100 % d.c. 640 A	100 % d.c. 720 A
Open-circuit voltage		70 V	70 V	70 V	70 V
Operating voltage	MIG/MAG	14.2 - 34.0 V	14.2 - 39.0 V	14.2 - 34.0 V	14.2 - 39.0 V
	TIG	10.1 - 26.0 V	10.1 - 30.0 V	10.1 - 26.0 V	10.1 - 30.0 V
	Electrode (MMA)	20.4 - 36.0 V	20.4 - 40.0 V	20.4 - 36.0 V	20.4 - 40.0 V
Degree of protection		IP 23	IP 23	IP 23	IP 23
Dimensions L x W x H	mm	625 x 290 x 475	625 x 290 x 475	2 x 625 x 290 x 475	2 x 625 x 290 x 475
	Inch	24.63 x 11.43 x 18.72	24.63 x 11.43 x 18.72	2 x 24.63 x 11.43 x 18.72	2 x 24.63 x 11.43 x 18.72
Weight		35.2 kg / 77.4 lb	35.6 kg / 78.3 lb	2 x 35.2 kg / 2 x 77.4 lb	2 x 35.6 kg / 2 x 78.3 lb



		VR 2000	VR 4000	VR 7000
Supply voltage		55 V DC	55 V DC	55 V DC
Rated current		4 A	4 A	4 A
Wire diameter		0.8-1.6 mm	0.8-1.6 mm	0.8-1.6 mm
Wirefeed speed		0.5-22 m/min	0.5-22 m/min	0.5-22 m/min
Degree of protection		IP 23	IP 23	IP 23
Dimensions L x W x H	mm	520 x 320 x 215	650 x 290 x 410	640 x 260 x 430
	Inch	20.49 x 12.61 x 8.48	25.61 x 11.43 x 16.16	25.22 x 10.25 x 16.95
Weight		9 kg / 19.8 lb	16 kg / 35.2 lb	18 kg / 39.6 lb



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